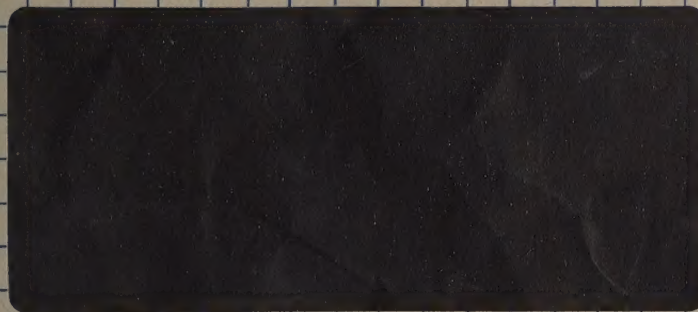
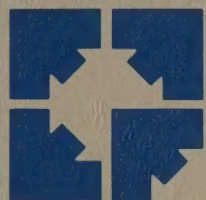


\$25.00



TECHNICAL MANUAL

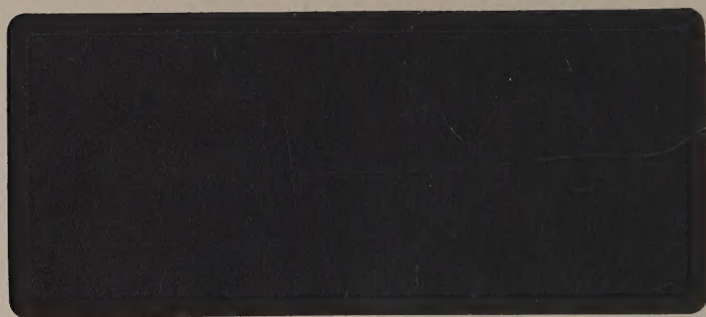


Forma Scientific

DIVISION OF MALLINCKRODT, INC.

BOX 649 MARIETTA, OHIO 45750 TELEX: 24-5394

TOLL FREE USA 800-848-3080, OHIO 614-373-4763



CAN YOU TRUST YOUR FORMA LAB EQUIPMENT?

You can. Knowing it's backed by Forma's professional service technicians — all as close as your telephone.

Our toll-free 800 LINE puts you in touch with the Forma service technicians — ready to help you with your equipment problems. Whatever Forma products you may use, it discusses your problem over the telephone. Working together, we'll help you locate the problem, and remove any, correct it yourself — over the phone, without an expensive service call.

When more extensive service is necessary, you can count on Forma for a fast, reliable, by our trained professional field service technicians. In addition to checking the reported problem, our technicians also check basic operations.

MODEL 2095

REFRIGERATED AND HEATED BATH

Manual 7022095

Control Circuit	Electrical Circuits
Temperature	Refrigerators
CW Levels	Stirrer/Pan
Heating Levels	Compressors

All to keep your Forma equipment in top condition, operating at the high standards you require.

WARNING! DO NOT operate the bath without liquid in it or severe damage to the bath will occur.

NOTE: DO NOT OVERFILL BATH! PLEASE ALLOW FOR THE ADDITION OF PRODUCT.

March, 1984

CAN YOU TRUST YOUR FORMA LAB EQUIPMENT?

You can, knowing it's backed by Forma's professional service technicians -- all as close as your telephone.

Our toll-free WATS lines put you in touch with the Forma service technicians, ready to help you with your equipment problems. Whatever Forma products you use, we'll discuss your problems over the telephone. Working together, we'll help you locate the problem, and chances are, correct it yourself. . . over the phone, without an expensive service call.

When more extensive service is necessary, you can count on Forma for on-the-spot repairs by our trained professional field technicians. In addition to checking the reported problem, our technicians also check basic operations, like:

Control Calibrations
Temperature
CO2 Levels
R. H. Levels

Electrical Circuits
Recorders
Blowers/Fans
Compressors

All to keep your Forma equipment in top condition, operating at the high standards you require.

Forma now offers a one-year parts and labor warranty on all standard laboratory equipment. And, in Chicago, IL; Columbus, OH; Los Angeles, CA; New York City; Newark, NJ; Philadelphia, PA; Washington, D. C., and the areas surrounding these cities where service coverage is by Forma direct service personnel, we offer our BI-ANNUAL PERFORMANCE CHECK. This program provides a complete checkout of your equipment twice a year and keeps minor problems from becoming major ones. If you are located in one of the areas listed above, and you would like to know more about our BI-ANNUAL PERFORMANCE CHECK, please contact us on the toll-free 800 number.

Take advantage of Forma's professional service technicians -- they're as close as your telephone. Call toll-free for information and assistance: 9 1-800-848-3080; in Ohio call 1-800-421-3080. Ex-U. S. customers please contact your local sales group.

INDEX

SECTION 1 - INTRODUCTION

- 1.1 General Information
- 1.2 Standard Features
- 1.3 Auxiliary Equipment

SECTION 2 - SPECIFICATIONS

- 2.1 Capacity and Weight
- 2.2 Dimensions
- 2.3 Construction
- 2.4 Heating and Refrigeration
- 2.5 Temperature
- 2.6 Electrical Requirements
- 2.7 Pump

SECTION 3 - OPERATION

- 3.1 Main Power Switch
- 3.2 Cool Switch
- 3.3 Indicating Lights

SECTION 4 - INSTALLATION & START-UP

- 4.1 Location
- 4.2 Installation of the Thermoregulator
- 4.3 Installation of the Thermometer
- 4.4 Filling and Emptying the Bath
- 4.5 Setting the Thermoregulator
- 4.6 Connecting to Power
- 4.7 Initial Settings
- 4.8 Making External Connections

SECTION 5 - ROUTINE MAINTENANCE

- 5.1 Cleaning the Bath
- 5.2 Cleaning the Refrigeration Unit
- 5.3 Pump

SECTION 6 - SERVICE

- 6.1 Replacing the Pump
- 6.2 Replacing the Heater
- 6.3 Replacing the Thermoregulator
- 6.4 Replacing the Integrated Circuit Board
- 6.5 Installing the Dual Stage Pump

1. GENERAL INFORMATION

The Model 2072 unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000. The unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000.

SECTION 1 - INTRODUCTION

Table of Contents

1.1 General Information

1.2 Standard Features

1.3 Auxiliary Equipment

DESCRIPTION: The Model 2072 unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000. The unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000.

FEATURES: The Model 2072 unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000. The unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000.

OPERATION: The Model 2072 unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000. The unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000.

MAINTENANCE: The Model 2072 unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000. The unit is designed to maintain a constant temperature by means of a pressure compensating valve of Model 2072-1000.

1.1 GENERAL INFORMATION

The Model 2095 bath is designed to maintain a constant temperature by means of a precisely controlled to plus or minus 0.02 degree C ultrasensitive thermoregulator. Constant circulation by the 1/12 HP pump insures temperature uniformity.

The bath is fitted with connections for external circulation. The single stage pump permits closed loop circulation to an external vessel. The bath is capable of open circulation when fitted with the optional dual stage pump.

1.2 STANDARD FEATURES

CONSTRUCTION: The tank, pump screen, and lid are constructed of heavy-duty stainless steel. Tank seams are heli-arc welded and polished smooth to produce a leak-proof tank.

HEATER: The stainless steel immersion heater is flange mounted from the top of the bath. The low mass design insures a rapid response to control.

PUMP: Forma's sealed ball-bearing pump is capable of producing 2 GPM at zero head and will pump to an 8 foot head. The quiet running, air-cooled motor requires no oiling. All wetted parts are stainless steel. An external flow valve allows for full circulation to open vessels.

REFRIGERATION SYSTEM: The refrigeration system is integrated with the solid state control circuitry and modulates the cooling capacity from 0 to 100% automatically, on demand. The heavy-duty, hermetically-sealed compressor is thermally protected; no lubrication is required. Service problems are minimized, because no by-pass valves or electrical relays are used.

SECTION 2 - SPECIFICATIONS

Table of Contents

- 2.1 Capacity and Weight
- 2.2 Dimensions
- 2.3 Construction
- 2.4 Heating and Refrigeration
- 2.5 Temperature
- 2.6 Electrical Requirements
- 2.7 Pump

2.1 CAPACITY AND WEIGHT

Tank Capacity: 7.5 Gallons (28.4 Liters)
Shipping Weight: 120 lbs. (55 kg)

2.2 DIMENSIONS

Work Tank: 13"H x 10"W x 12"D
33cm H x 25.4cm W x 30.5cm D
Exterior: 16"H x 26-5/8"W x 14-1/2"D
40.6cm H x 67.6cm W x 36.8cm D

2.3 CONSTRUCTION

Exterior: 20 Gauge Cold-Rolled Steel
Interior: 20 Gauge Stainless Steel
Insulation: Polyurethane
Finish: Polyurethane Enamel

2.4 HEATING AND REFRIGERATION

Heater: 12" Flanged
Refrigeration: 1/5 HP Compressor with R12 Refrigerant
BTU Removal Capacity: 1750 BTU/Hr at +20 Degrees C
1000 BTU/Hr at 0 Degrees C

2.5 TEMPERATURE

Range: -20 to +70 Degrees C
Control Sensitivity: Plus or Minus 0.02 Degrees C

2.6 ELECTRICAL REQUIREMENTS

115v, 50/60 Hz, 12 FLA

2.7 PUMP

Single Stage: 2 GPM, 1/12 HP
Maximum Head: 8 Feet

SECTION 3 - OPERATION

Table of Contents

- 3.1 Main Power Switch
- 3.2 Cool Switch
- 3.3 Indicating Lights

3.1 MAIN POWER SWITCH

The main power switch controls power to the bath.

3.2 COOL SWITCH

The cool switch controls the on/off power to the refrigeration unit compressor. It should be turned ON when the desired operating temperature of the bath is to be below 40 degrees C.

3.3 INDICATING LIGHTS

There are three indicating lights on the control panel of the 2095 bath:

- 1) The MAIN POWER LIGHT indicates when the main power switch is in the on position, and the unit is receiving power.
- 2) The COOL LIGHT cycles opposite the refrigeration capacity modulator, and indicates when there is a demand for cooling.
- 3) The HEAT LIGHT cycles with the bath heater, and indicates when there is a demand for an increase in bath temperature.

SECTION 4 - INSTALLATION & START-UP

Table of Contents

- 4.1 Location
- 4.2 Installation of the Thermoregulator
- 4.3 Installation of the Thermometer
- 4.4 Filling and Emptying the Bath
- 4.5 Setting the Thermoregulator
- 4.6 Connecting to Power
- 4.7 Initial Settings
- 4.8 Making External Connections

**WARNING! DO NOT ATTEMPT TO OPERATE THE BATH WITHOUT LIQUID
IN IT OR SEVERE DAMAGE TO THE UNIT WILL OCCUR!**

4.1 LOCATION

Locate the bath on a firm, level surface in an area of minimum ambient temperature fluctuation.

4.2 INSTALLATION OF THE THERMOREGULATOR

- 1) Carefully remove the thermoregulator from the packing tube.
- 2) Check to see if the mercury in the thermoregulator has separated during shipping. If it has separated, grasp the thermoregulator, bulb down, in one hand, and gently tap it against the other hand until the mercury joins.
- 3) Loosen the large black nut located in front of the heater on the top surface of the unit.
- 4) Insert the thermoregulator down through the nut into the bath area.
- 5) Hold the thermoregulator so that approximately 1/2" of the glass portion extends above the large black nut. Tighten the nut until it is finger tight - DO NOT OVERTIGHTEN!
- 6) Plug the cord that extends from the back of the unit into the head of the thermoregulator.

4.3 INSTALLATION OF THE THERMOMETER

- 1) Carefully remove the thermometer from the shipping tube.
- 2) Gently insert the thermometer into the hole provided on the top of the unit. The thermometer should slip in until it rests on the thermometer holder.

4.4 FILLING AND EMPTYING THE BATH

WARNING: DO NOT OVERFILL BATH! PLEASE ALLOW FOR THE ADDITION OF PRODUCT.

Fill the bath to a level 1-3/4" from the top of the tank. Water is recommended as the fluid medium for applications requiring temperatures above 10 degrees C. For applications below 10 degrees C, Methanol or a solution of antifreeze and water is recommended. Follow the directions on the antifreeze container for the proper mix.

To empty the bath, siphon the liquid. DO NOT attempt to empty the bath by tipping it or severe damage may occur.

4.8 MAKING EXTERNAL CONNECTIONS

To set up the bath for external circulation in a closed loop system:

- 1) Connect one end of the tubing to be utilized to the supply valve, and the other end to the return elbow on the top surface of the bath.
- 2) Use short, large diameter, insulated lines to eliminate frost and reduce thermal lag.
- 3) Open the supply valve, and regulate the flow.
- 4) Check the system for leaks.

SECTION 5 - ROUTINE MAINTENANCE

Table of Contents

- 5.1 Cleaning the Bath
- 5.2 Cleaning the Refrigeration Unit
- 5.3 Pump

5.1 CLEANING THE BATH

The bath interior should be cleaned with a general purpose laboratory disinfectant. Information on disinfectants recommended by Forma Scientific, Inc. is included as a supplement to this manual.

The cabinet exterior may be cleaned with soap and water or with any non-abrasive commercial spray cleaner.

The bath interior should be kept clear of any matter that may clog the pump.

5.2 CLEANING THE REFRIGERATION UNIT

Twice a year, the dirt that has built up on the outside of the compressor and fan should be vacuumed or blown off. This permits a free flow of air around the refrigeration unit and allows it to operate more efficiently. In areas where there is a high particulate content in the air, the refrigeration unit should be cleaned more often.

5.3 PUMP

The pump has been permanently lubricated and will never need to be oiled with normal usage.

SECTION 6 - SERVICE

Table of Contents

- 6.1 Replacing the Pump
- 6.2 Replacing the Heater
- 6.3 Replacing the Thermoregulator
- 6.4 Replacing the Integrated Circuit Board
- 6.5 Installing the Dual Stage Pump
- 6.6 Troubleshooting
- 6.7 Parts List, Schematics, Warranty Information

CAUTION! SERVICE MUST BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY!

6.1 REPLACING THE PUMP

- 1) Turn OFF the power, and disconnect the bath from the power supply.
- 2) Drain the bath by siphoning out the liquid.
- 3) Remove the baffle panel inside the bath by removing the two screws on the top edge of the panel and lifting it off the two studs on the floor of the bath.
- 4) With a pair of suitable pliers, disconnect the hose from the pump outlet.
- 5) Open the access panel by removing the screws holding the door in place. Remove the panel.
- 6) Follow the cable from the pump through the back of the cabinet to the back of the terminal strip.
- 7) Remove the strain relief bushing on the cable with suitable pliers.
- 8) Gently pull on the cable to aid in identifying the wires. Disconnect the three pump wires from the terminal strip.
 - Green on #7, White on first #1, Black on first #6
- 9) Feed the wires out through the back of the unit.
- 10) Remove the four screws holding the pump housing to the top of the unit.
- 11) Gently lift out the pump.
- 12) Replace the pump with Forma Part #901200 by reversing the above procedure.

6.4 REPLACING THE INTEGRATED CIRCUIT BOARD

- 1) Turn OFF the power, and disconnect the unit from the power source.
- 2) Open the access panel by removing the screws, and remove the panel.
- 3) Locate the integrated circuit board mounted to the right of the terminal strip.
- 4) Unplug the molex connector (the plug with the wires connected to it on the front of the board).
- 5) There are two nuts that hold the entire terminal panel to the inside top of the cabinet. Remove the nut on the right, and loosen the left nut enough to swing the panel outwards.
- 6) Remove the two screws holding the circuit board in place.
- 7) Replace the circuit board with Forma Part #285474.

6.5 INSTALLING THE DUAL STAGE PUMP (Option)

- 1) Disconnect the bath from its power source.
- 2) Remove the single stage pump as outlined in Section 6.1. Note the angle of the pump outlet for reference in installing the dual stage pump.
- 3) Lower the dual stage pump into the pump well. Be sure to install the pump at the same angle as the single stage pump.
- 4) Clamp the pressure hose to the top connection on the pump.
- 5) Clamp one end of the suction hose to the bottom connection on the pump and the other end to the interior connection on the return elbow.

6.6 TROUBLESHOOTING

The following is intended as a guide to be used in servicing the unit should a problem occur. Servicing MUST be performed by qualified service personnel ONLY!

PROBLEM: Bath appears dead; pilot lights are off.

POSSIBLE CAUSES:

- a) Line cord not plugged in.
- b) No current at receptacle.
- c) Defective line cord.
- d) Defective power switch.

PROBLEM: Will not cool; cool light is on.

POSSIBLE CAUSES:

- a) Thermal overload on compressor.
- b) Defective starting relay on compressor.
- c) Defective refrigeration circuit.
- d) Inadequate circulation in bath.
- e) Cooling coils iced over.
- f) Defective control unit.

PROBLEM: Will not cool; cool light is off.

POSSIBLE CAUSES:

- a) Defective cool switch.
- b) Defective integrated circuit board.

PROBLEM: Will not heat; heat light is on.

POSSIBLE CAUSE: Burned out heaters or associated wiring.

PROBLEM: Will not heat; heat light is off.

POSSIBLE CAUSES:

- a) Defective integrated circuit board.
- b) Defective thermoregulator.

b) Defective thermostat on the refrigeration capacity modulator.

PROBLEM: Bath temperature is consistently off 3 or 4 degrees C.

POSSIBLE CAUSE: Mercury in thermoregulator has separated.

PARTS

For information concerning replacement parts, refer to the following list.

QUANTITY	DESCRIPTION	STOCK #
1	16/3 SJT Cord Set, 8 ft.	950020
1	Cartridge Heater 650W	600455
1	Thermoregulator Holder	940560
2	Rocker Switch DPST	360054
1	20 Terminal Board	285250
1	Wired T-Reg Bath Control	190070
1	Cartridge Heater 125W	600450
1	#312 Green Pilot Light	280004
2	#312 Amber Pilot Light	280006
1	-30 to +70 Degree C Thermo-regulator	940540
1	-40 to +100 Deg. C Thermo-meter	234000
1	Single Stage Long Column Pump	901200
1	TECH. MANUAL 2095 REF. BATH	

CA 3059

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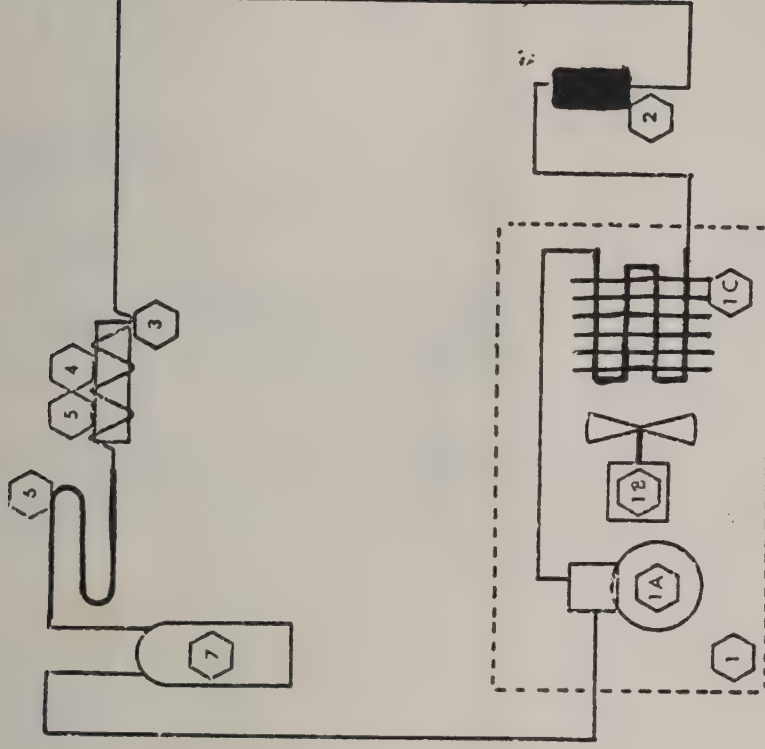
- 1 990202 Condensing Unit 115V
- 2 991001 Filter Drier
- 3 990702 Capillary Tube 5' - .044
- 4 270091 Snap Action Thermostat
- 5 600450 Cartridge Heater
- 6 990723 Evaporator
- 7 993000 Suction Accumulator

2100 - Export

- 1 990203 Condensing Unit 220-1-50
- 2 991001 Filter Drier
- 3 990702 Capillary Tube 5' - .044
- 4 270091 Thermostat
- 5 620000 Cartridge Heater
- 6 990723 Evaporator
- 7 993000 Suction Accumulator

- 1A - Motor Compressor
- 1B - Fan Assembly
- 1C - Air Cooled Condenser

Refrigerant - R12 - 11ozs.



CUSTOMER APPROVAL/REFERENCE

APPROVED BY _____

APPROVING FIRM _____

DATE OF APPROVAL _____

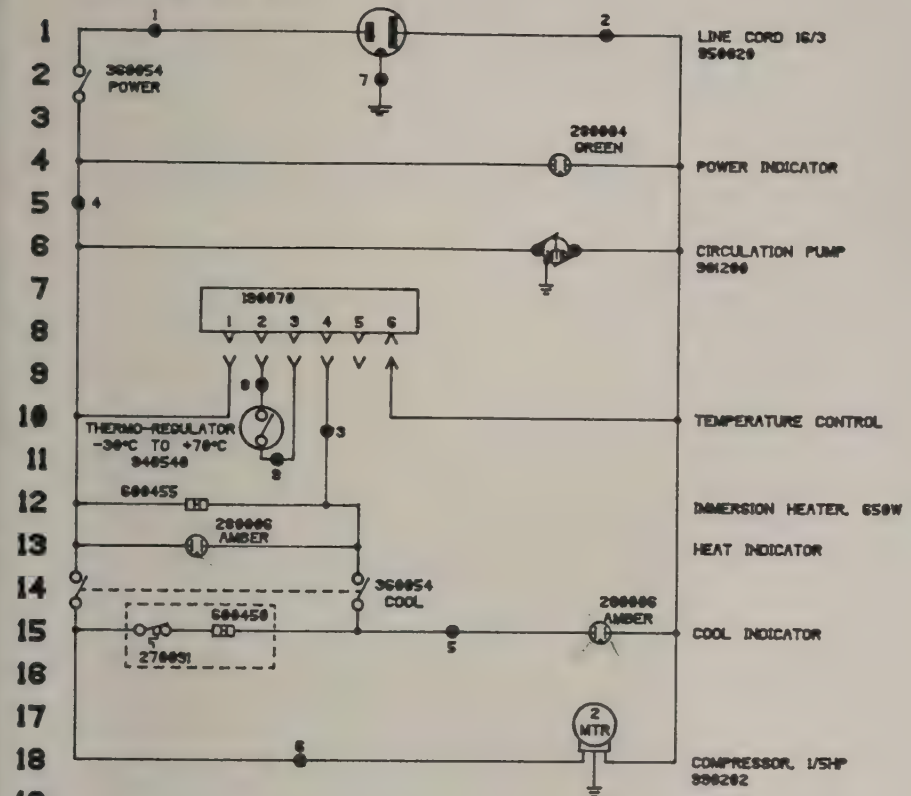
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FORMA SCIENTIFIC

REV	DATE	DESCRIPTION OF REVISION	BY	APPVD
OWN		APPVD	DATE	SCALE
CUST				
JOB TITLE 2095 BATN				
DWG TITLE Refrigeration Schematic				
JOB NUMBER		DRAWING NUMBER		

POWER CONNECTION:
120V, 1PH, 2W, 60HZ, 12FLA



WIRE REFERENCE

NO.	GA.	C
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TERMO-REGULATOR LEADS

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NOTES:		CONTAINER APPROVAL/REFERENCE			
☒ Broken Terminal Strip Connection ☐ Loose Terminal Strip ☐ Lost Ring Number ☐ Assembly ☐ Lost Terminal Number ☐ Panel ☐ Lost Wire Number ☐ Substitution ☐ ☐ Wrong		APPROVED BY: _____ APPROVED FOR: _____ DATE OF APPROVAL: _____ THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND USE INFORMATION IS NOT TO BE DISCLOSED TO OTHERS FOR ANY PURPOSES AND SHALL REMAIN THE PROPERTY OF PERMA SCIENTIFIC			
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GENERAL USE LABORATORY DISINFECTANTS FROM FORMA SCIENTIFIC

AMPHYL[®] Spray

DISINFECTANT-DEODORANT

O-Syl[®] DISINFECTANT-
DETERGENT

ROCCAL[®] II

SANITIZING AGENT/
GERMICIDE-ALGICIDE
DEODORIZER

For use in and around the laboratory. Perfect for cleaning incubators. Ideal for biological storage freezers, glassware washers, baths and circulators . . . anywhere you must prevent cross contamination, reduce chances of infection.

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AMPHYL® Spray

DISINFECTANT-DEODORANT

E.P.A. Reg. No. 675-25-AA

ABSORBS ODORS, CUTS DOWN CONTAMINATION.

Amphyl Spray is a true laboratory disinfectant. That means it's effective against Staphylococci, Pseudomonas, Tubercle Bacilli, Coliform, and various fungi, including mold and mildew. Spraying for two to three seconds, until surfaces are wet, helps prevent cross contamination even in hard to reach areas.

MICROBIOLOGICAL TESTS:

- I. METHOD: A.O.A.C. (11th Edition) Germicidal Spray Method — Official
AGAINST: Staphylococcus aureus — 180 slides tested; 0 growth
Salmonella choleraesuis — 90 slides tested; 0 growth
Pseudomonas aeruginosa — 90 slides tested; 0 growth
Trichophyton interdigitale — 20 slides tested; 0 growth
- II. METHOD: A.O.A.C. (11th Edition) Tuberculocidal Activity Tests
10 slides tested and cultured in Proskauer-Beck Middlebrook and Kirchner media; 0 growth
- III. METHOD: Virucidal Activity Test Method of Dr. Morton Klein, Temple University, accepted by E.P.A.
AGAINST: Herpes simplex, Vaccinia and Influenza A-2
RESULTS: All viruses treated with AMPHYL Spray Disinfectant were completely inactivated.
- IV. METHOD: E.P.A. Pesticide Regulation Division, March 19, 1969, Hard Surface Mildew Fungistatic Test.
AGAINST: Aspergillus niger, used as required.
RESULTS: No growth observed during 30 days' incubation.
- V. METHOD: E.P.A. Pesticide, Regulation Division, March 19, 1969, Fungicidal Activity (for mold & mildew)
AGAINST: Aspergillus niger
RESULTS: 20 slides tested — 0 growth
- VI. METHOD: E.P.A. Pesticide Regulation Division, March 19, 1969, Fabric Mildew Fungistatic Test
AGAINST: Aspergillus niger and Penicillium variable, used as required
RESULTS: No growth observed during 30 days' incubation.

ORDERING INFORMATION:

Catalog No.	Minimum Order
170002	1 case (twelve 14 oz. Aerosol Cans)

O-Syl[®]

DISINFECTANT-
DETERGENT

E.P.A. Reg. No. 675-24-AA

A COMBINATION CLEANER AND DISINFECTANT WITH A BROAD-SPECTRUM ANTIMICROBIAL ACTIVITY.

O-SYL destroys a wide variety of pathogenic organisms on environmental surfaces including *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Proteus vulgaris*, *Candida albicans*, and *mycobacterium tuberculosis* at a use-dilution of 1:128. It is also virucidal against such common viruses as Influenza A-2, Herpes simplex, vaccinia, and Adenovirus Type 2.

This phenolic disinfectant-detergent can be used for general disinfecting and cleaning laboratory floors, walls, fixtures, and laboratory equipment.

O-SYL is effective in the presence of organic matter, it is useful for disinfecting areas or articles contaminated by purulent material, blood, serum, or excreta even when the pathogen is the tubercle bacillus.

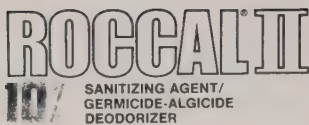
MICROBIOLOGICAL TESTS:

Tests against various organisms (Tested in both 400 ppm hard water and distilled water) (O-SYL at a Use-Dilution of 1:128). Test Procedure: As described by Official Methods of Analysis of the Association of Official Analytical Chemists: 61-63, 11th Edition, Washington, D.C., 1970, but modified where necessary for the specific microorganism.

TEST ORGANISM	SUBCULTURE MEDIA	RESULT OF 10 MIN. USE-DILUTION (NO. OF CYLINDERS PLUS OF EACH 20 TESTED.)
<i>Salmonella choleraesuis</i> ATCC 10708	Letheen Broth	0
<i>Salmonella paratyphi</i> ATCC 9281	Letheen Broth	0
<i>Salmonella schottomuelleri</i> ATCC 10719	Letheen Broth	0
<i>Shigella dysenteriae</i> ATCC 11835	Letheen Broth	0
<i>Enterobacter aerogenes</i> ATCC 13048	Letheen Broth	0
<i>Proteus vulgaris</i> ATCC 9920	Letheen Broth	0
<i>Escherichia coli</i> AMC 198 (ATCC 11229)	Letheen Broth	0
<i>Pseudomonas aeruginosa</i> ATCC 15442	Letheen Broth	0
<i>Klebsiella pneumoniae</i> ATC 9997	Letheen Broth	0
<i>Neisseria elongata</i> ATCC 25295	Letheen Broth	0
<i>Serratia marcescens</i> ATCC 8195	Letheen Broth	0
<i>Staphylococcus aureus</i> 209 ATCC 6538	Letheen Broth	0
<i>Staphylococcus aureus</i> 80/81 (Penicillin resistant)	Letheen Broth	0
<i>Streptococcus faecalis</i> ATCC 828	TSB w/Letheen	0
<i>Streptococcus pyogenes</i> ATCC 12384	TSB w/3% sheep blood	0
<i>Streptococcus salivarius</i> ATCC 9222	TSB w/3% sheep blood	0
<i>Corynebacterium diphtheriae</i> ATCC 11913	TSB w/Letheen	0
<i>Candida albicans</i> ATCC 10231	F-Broth w/Letheen	0
<i>Trichophyton interdigitale</i> ATCC 640	F-Broth w/Letheen	0

ORDERING INFORMATION:

Catalog No.	Minimum Order
170001	1 case (six 1 gallon bottles)



E.P.A. Reg. No. 675-30-AA

BACTERICIDAL, KILLS MILDEW, PREVENTS GROWTH OF ALGAE IN WATER-JACKETED INCUBATORS.

ROCCAL II 10% is germicidal sanitizing agent effective against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, and *Salmonella choleraesuis* when diluted 1 oz. per gallon (800 ppm).

ROCCAL II 10% is also used as an algae preventative in incubator water jackets. Five milliliters added to each 18 gallon Forma Water-Jacketed Incubator when filling will provide lasting protection . . . will not harm sensitive temperature probes. ROCCAL II 10% is also used to prevent microbial growth in humidity reservoirs when diluted 2 milliliters per liter demineralized water.

ORDERING INFORMATION:

Catalog Number	Minimum Order
170003	1 case (four 1 gallon bottles)



GUARANTEE

Modern manufacturing facilities and careful laboratory control assure materials of uniform quality at all times. National Laboratories' products are unconditionally guaranteed to give complete satisfaction when used as directed or they may be returned for credit.

Amphyl, O-SYL, and ROCCAL II are registered trademarks of National Laboratories.

FORMA STANDARD PRODUCT WARRANTY

Dear Customer:

Good performance is what you expect when you buy products from Forma Scientific. We, too, are concerned about performance. That's why we offer the following One Year Protective Warranty:

The Warranty Period starts two weeks from the date your equipment is shipped from our factory. This allows for ample shipping time so that the warranty will go into effect at approximately the same time your equipment is delivered. This same protection extends to any subsequent owner during the warranty period.

During the one year warranty period, component parts proven to be defective in materials or workmanship will be repaired or replaced at our expense, labor included. Installation and calibration is not covered by this warranty agreement. The Forma Scientific Service Department must be contacted for warranty determination and direction prior to any work being done.

Expendable items such as glass, filters, pilot lights, light bulbs, and door gaskets are excluded from this warranty coverage. Naturally, our warranty does not cover damage caused by accident, misuse, fire, flood, or acts of God.

Replacement or repair of component parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original one year warranty period. The Forma Service Department must give prior approval for the return of any components or equipment.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Forma Scientific shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

A word on installation and operation. We know you expect a proper installation. Your local Forma Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation, and preventive maintenance.

And about equipment service? Let's face it. Even the best products need service. If this occurs, please call your Forma Service Office at 1-800-848-3080 in the USA. (Ohio customers call 1-800-421-3080, and Canadian customers 1-800-327-3080.) We're ready to answer your questions on equipment warranty, operation, maintenance, service and special applications.

We encourage you to keep this warranty explanation. You may never need it, but it's nice to know the protection is there.

Sincerely,
FORMA SCIENTIFIC
DIVISION OF MALLINCKRODT, INC.

CONDITIONS AND TERMS OF SALE

SPECIFICATIONS AND MATERIAL CHANGES: Forma Scientific reserves the right to offer our latest and improved models at time of shipment.

SHIPMENTS: All shipments are FOB Marietta, Ohio, freight prepaid and add. Unless specific shipment instructions are provided, shipment will be made by the least expensive method.

PRICES: All prices are firm for the delivery period specified, based on receipt of a purchase order within 30 days. Purchase Orders received after this time are subject to review and price adjustment. If, after acceptance of a Purchase Order the required delivery date is modified by the customer, Forma reserves the right to adjust the price to recover additional expenses incurred, due to increase in labor or material cost (including mark-up), inventory expenses, and such like. In addition, Forma Scientific will be entitled to invoice and receive payment for 90% of the value of labor and material expended.

TAXES: The prices quoted do not include any state, local or federal taxes.

PAYMENT: All payments are net 30 days from date of shipment. Order acceptance is subject to approval of our Credit Department.

CANCELLATION: Orders shall not be subject to cancellation unless cancellation charges are paid by the purchaser. Custom, non-catalog and modified units are not subject to cancellation under any condition.

DAMAGES OR SHORTAGES: Claims for shortages in shipment must be made within 5 working days of receipt of material. If the outer crate or carton is damaged in any way, customer should not sign the bill of lading until the carrier notes such damage on the bill of lading. Without this notation, carriers usually refuse customer damage claims. Unauthorized returns of goods will be refused at Forma's dock. Authorized returned goods will be allowed at a 20% restocking charge plus whatever expenses are necessary to return material to first class, saleable condition. Custom fabricated or modified equipment is not subject to return under any condition.

DELIVERY: Delivery dates are approximate and based on production at time of quotation. Forma shall not be liable for damages to the buyer for any default or delay in delivery for any reason. Every effort shall be made to meet the delivery quoted, but failure to meet the estimated delivery will not be considered cause for cancellation and/or claims which may arise from such delay.

LIMITATION OF LIABILITY: In no event, whether as a result of breach of contract, warranty or tort (including negligence and strict liability), shall Mallinckrodt, Inc. or its division Forma Scientific (both noted hereinafter as Mallinckrodt) be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of the equipment or any associated equipment, down-time costs, cost of substitute equipment, costs of labor, costs due to delays or claims of Customer's own customers for such damages. Customer agrees to indemnify Mallinckrodt and hold Mallinckrodt harmless from any and all liability, claims, demands, actions, suits, expenses or costs, including reasonable attorney's fees relating to such consequential or incidental damages.

The responsibility of Mallinckrodt for damages due to injuries, or the death of employees of the Customer, or ultimate user of the equipment being serviced, caused by the equipment, shall be limited to that portion of such damages as might be attributable to the negligence of strict liability of Mallinckrodt. The Customer and ultimate user agree to indemnify Mallinckrodt and hold Mallinckrodt harmless from any further damages, indemnity or contribution. All warranties, limitations of liability and indemnities provided herein will survive the termination of this agreement.

Mallinckrodt's liability for any claim of any kind (including negligence and strict liability) for any loss or damage arising out of, or resulting from, this agreement or from the performance or breach thereof, or from the Services, Products or Parts furnished hereunder shall in no case exceed the price of the same giving rise to the claim.

INSTALLATION: Installation of all equipment shall be by, and at the expense of, the purchaser unless quoted herein. When installation is quoted it is understood that elevator service will be made available to Forma Scientific at no charge to move the equipment to specified locations. If elevator service is not available or if access to the specified location is not adequate, Forma Scientific reserves the right to bill the purchaser for the additional cost of work required.

ACCEPTANCE: Orders, terms and specifications are subject to approval of Forma Scientific, Home Office. No variation shall be binding unless in writing signed by a Forma executive officer.

